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ADDENDUM TO FINAL PHASE III RFI/RI WORK PLAN

REVISION 1

ROCKY FLATS PLANT

881 HILLSIDE AREA

(OPERABLE UNIT NO. 1)

U S DEPARTMENT OF ENERGY
Rocky Flats Plant
Golden, Colorado

ENVIRONMENTAL RESTORATION PROGRAM

June 1991

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FINAL PHASE III RFI/RI WORK PLAN
REVISION I
881 HILLSIDE AREA
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U S DEPARTMENT OF ENERGY
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ADDENDUM TO
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REVISION 1
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This document provides analysis and rationale for amending the analytical strategy for the RCRA Facility Investigation/CERCLA Remedial Investigation (RFI/RI) at Operable Unit No 1 (OU1) The RFI/RI Work Plan stipulates that soils, sediments, ground water, and surface water be analyzed for all Contract Laboratory Program (CLP) Target Compound List (TCL) organic constituents The analytical program is conservative for various reasons discussed herein, however, considering that the RFI/RI for OU 1 is in its third phase, it appears that the need for such a comprehensive analytical program should be reevaluated This document presents a historical review of how the analyte lists evolved as well as an analysis of available sampling results from OU 1 as justification for eliminating certain analytical suites from the overall program The basis for developing a site-specific target analyte list is discussed in U S Environmental Protection Agency (EPA) guidance documents for conducting remedial investigations and feasibility studies (EPA, 1988) and for developing data quality objectives for remedial response activities (EPA, 1989) As discussed with EPA and the Colorado Department of Health (CDH) in a meeting on 17 May 1991, the approach is applicable to establishing the analytical strategy for the upcoming OU 1 RFI/RI

BACKGROUND

Comprehensive site characterization began at OU 1 in 1986 A Phase 1 RI report for OU1 was submitted in June 1987, and a Phase II report submitted in March 1988 Site characterization for these previous RIs was based on analysis of soils, sediments, ground water and surface water for the CLP Hazardous Substance List (HSL) compounds (Currently this list of analytes is known as the TCL, however, it should be noted that there are minor differences in the two lists) A Phase III RFI/RI Work Plan has been prepared for OU 1 which is designed to fill data gaps that were identified in the earlier phases of investigation

The OU 1 RFI/RI Work Plan specifies analysis of soils, sediments, ground water, and surface water for all TCL organic compounds Analysis for the full suite of TCL organics for ground water and surface water beyond the first round of samples would be dependent on the initial results The need for continued full suite analysis would be based on an assessment approach not unlike that presented in this document The TCL was chosen as the basis for characterizing this OU because it is used by EPA in characterizing uncontrolled hazardous waste sites where historical waste disposal practices are often unknown, and because of the associated high quality assurance/quality control procedures that are widely accepted by both federal and state agencies Although chlorinated solvents are the principal contaminants at this OU based on historical

waste disposal records and previously collected data, a list of all chemicals disposed at this location is not known, which established the need for monitoring for a more comprehensive list of analytes

With respect to soils, the full suite of TCL organics was specified, because the upcoming phase of investigation is designed to provide a comprehensive characterization eliminating the need for subsequent phases of investigation More specifically, semivolatiles and pesticides/PCBs were to be analyzed at OU1 because previously collected data indicated the ubiquitous occurrence of phthalate esters and the infrequent occurrence of other semivolatile compounds and PCBs Also, several proposed waste investigation boreholes will penetrate waste sources (Individual Hazardous Substance Sites [IHSSs]), where previous targeted soil sampling was outside the waste source boundaries Thus, the full suite of TCL organics is specified because of the uncertainty of the types of waste that were disposed at these OU1 IHSSs

Ground water and surface water are to be analyzed for the full suite of TCL organics because of the infrequent occurrence of semivolatiles or pesticides/PCBs as indicated by previously collected data, and the limited quantity of historical data for these classes of chemicals (one to two rounds) Sediments will also be analyzed for the full suite of TCL organics largely because of it's relevance to contaminant migration in surface water

APPROACH

The approach to defining a site-specific target analyte list consists of the following two steps

Step 1. Summarize Existing Analytical Data by Analytical Suite

In step 1, existing data are tabularized showing the total number of analyses for each chemical within an analytical suite, and the total number of detections of each chemical This is performed for each medium that was characterized Seven analytical suites within three major chemical groupings based on analytical protocol can be identified The analytical suites are as follows

Group A Compounds, TCL Volatiles

I Ketones and Aldehydes
II Monocyclic Aromatics
III Chlorinated Aliphatics

Group B Compounds, TCL Semivolatiles

IV Acid Extractables

V Base Neutral Extractables

Group C Compounds, Pesticides/PCBs

VI PCBs
VII Pesticides

This exercise yields one of three possible outcomes

1) **Case 1.** Chemicals within one or more analytical suites in a specified media have not been detected at a given detection limit

2) **Case 2.** One or more chemicals from an analytical suite have been detected in a specified media either inconsistently or at low concentrations

3) **Case 3.** Consistent detections of one or more chemicals from an analytical suite in a specified media

Step 2, Evaluation of Results

Each of the cases identified above have implications with regard to the elimination of an analytical suite from the analytical program In Case 1, a strong case can be made to eliminate the analytical suite provided the historical data are of adequate quality or useability, and are representative of the site Data quality is assessed in accordance with the ER Program Quality Assurance Project Plan (QAPjP) and the General Radiochemistry and Analytical Services Protocol (GRAASP), and references therein Evaluation of representativeness must include spatial considerations. For example, if the chemicals within one or more analytical suites were not detected, it is necessary to be sure all potential waste sources were investigated For Case 3, continued monitoring for the analytical suite(s) in order to better characterize the medium is justified, particularly if the chemicals are mobile and toxic Elimination of a suite of chemicals, where historical data fit Case 2, requires an assessment of data quality, spatial representativeness, temporal considerations (depending on the concentrations observed), chemical fate and transport, and human risks posed by the chemicals

Assessment of chemical fate and transport and human/environmental risks is one of determining whether the chemical is at a concentration in a specific medium that poses an unacceptable risk to humans or the environment through a likely exposure pathway, and whether the chemical can migrate to another medium at concentrations that also pose an unacceptable risk

Fate and Transport

Table 1 presents some of the relevant chemical/physical parameters that relate to the environmental fate and transport of representative chemicals from each of the analytical suites previously identified The

general tendency for chemicals from each group to migrate from one environmental medium to another is discussed below This is summarized in Table 2

Group A Compounds, TCL Volatile Organic Compounds

Generally, TCL volatiles have computed mobility indices that suggest high mobility in the environment They are characterized by relatively high water solubility (greater that 100 mg/l) and volatility (vapor pressures generally much greater than 1 mm Hg and Henry's Law Constants greater than 0 1) Volatiles can be expected to migrate through soils, and to be transported by ground water and surface water as neutral solutes This is denoted by the saturated zone retardation factors (Rds) between 1 and 50 (Note chemical migration velocity = water migration velocity/Rd) The substantial vapor pressures and Henry's Law Constants suggest a tendency to volatilize from aqueous systems (including soil water) to the atmosphere

Group B and C Compounds, Semivolatiles and Pesticides/PCBs

In general, semivolatiles and pesticides/PCBs are considered to be slightly to very immobile (pesticides and PCBs are particularly immobile) Again this is denoted by the high saturated zone retardation factors Phenols are the most mobile of these compounds owing to their high water solubility Semivolatiles and pesticides/PCBs exhibit low to negligible volatility as indicated by the very low vapor pressures and Henry's Law Constants This suggests a low propensity for volatilization of these compounds to the atmosphere from soil and soil water

Toxicity

Without the benefit of a risk assessment, it is necessary to rely on published acceptable concentrations for chemicals to estimate the risk posed by the various chemicals in each of the media they are found Many of these published standards are considered Applicable or Relevant and Appropriate Requirements (ARARs) In this analysis, Safe Drinking Water Act (SDWA) Maximum Contaminant Levels (MCLs) (an ARAR) and Action Levels under EPA's proposed RCRA Corrective Action Regulations (FR v 55, No 145, July 27, 1990, 40 CFR 264 521) are used to provide an estimate of concentrations of chemicals that are protective of human health The Action Levels are based on likely chemical exposure scenarios, a 10^{-6} incremental cancer risk (for carcinogens), or a no adverse health effect from a lifetime of exposure to a systemic contaminant (non carcinogen) MCLs and Action Levels used in this assessment are shown in Table 3

FINDINGS

Data Considered in This Evaluation

Data for OU1 contained in the Rocky Flats Environmental Data Base System (RFEDS) were used to perform this evaluation Data for the boreholes, ground-water wells, surface water stations, and sediment stations listed in Table 4 have been summarized in this document This includes all existing soil/sediment data (including soil samples from the French Drain Geotechnical Investigation) and surface water and ground-water data collected through 1990 (and some more recent data)

Data Quality, Useability, and Representativeness

With the exception of the cases discussed below, soil and water quality data are either valid or acceptable with qualifications, based on limited data validation conducted in accordance with guidance provided in the QAPjP and GRAASP With respect to both soils and ground water, high concentrations of acetone, butanone, and methylene chloride in the laboratory blanks for the 1986 and 1987 investigations render it impossible to ascertain their presence in samples as an indication of site contamination Furthermore, volatile organic data for soils were rejected principally because of the high dilutions used (high detection limits) Since the 1986 and 1987 investigations, the sample collection methodology for volatiles in soils has been significantly improved to prevent volatile release during sample handling. Therefore, these soil data have little or no useability In contrast, semivolatile and pesticide/PCB analyses of soils are valid or acceptable with qualifications based on the limited data validation However, it is noted that the presence of phthalate esters in soil samples is presumed to be a result of sample contact with plastic during handling This will be resolved during the Phase III investigation

With respect to representativeness, the previous results are from boreholes, wells and surface water/sediment stations that span the entire OU However, boreholes at OU1 did not penetrate all the IHSSs Therefore, previous soil data cannot always be considered representative of buried wastes characteristics for all IHSSs Also, ground-water and surface water semivolatile and pesticide/PCB data are based on one or two rounds The impact of these observations are discussed further in the following section

Results

Table 5 provides a tabulation of the total number of analyses (based on summing the number of analyses performed for each chemical within an analytical suite) for each analytical suite and the number of

occurrences for which a chemical was detected A detection is defined as all reported concentrations of a chemical, including those estimated below detection limits ("J" qualifier)

Ground Water and Surface Water

Volatiles

As shown in Tables 6 and 7, volatiles are frequently detected and in significant concentrations The chlorinated aliphatics occur often and occasionally at high concentrations These compounds are known waste constituents and are relatively toxic As a class, the volatiles represent Case 3

However, the monocyclic aromatics (benzene, toluene, ethylbenzene, and xylene) occur infrequently Toluene, ethylbenzene, and xylene occur at concentrations an order of magnitude below their health-based reference concentrations Benzene occurs least frequently of the compounds in this class (only 2 occurrences in 426 total analyses) Only one of these occurrences (83 $\mu g/\ell$) was above the health-based reference concentration (5 $\mu g/\ell$) The rare occurrence of benzene and other aromatics, combined with their low concentrations, warrants discontinuation of analysis for this class of compounds Also note that the monocyclic aromatics are easily removed from water by activated carbon or air stripping, and therefore pose no unusual treatment requirements where ground water or surface water treatment will be necessary during remediation Nevertheless, because the elimination of monocyclic aromatics from the TCL volatiles is not technically efficient, ground-water and surface water samples will be analyzed for monocyclic aromatics.

Acetone, and to a lesser extent other ketones, appear in the samples However, the occurrence of acetone and 2-butanone in a sample is often due to laboratory contamination, and there are no occurrences of acetone or 2-butanone above their action levels Concentrations of these ketones are generally two orders of magnitude less than the action level Based on the high health-based reference concentrations (action levels) of acetone and 2-butanone, it can be surmised that ketones are relatively non-toxic, and the less frequent occurrence of other ketones at low concentrations is of little concern Therefore, ketones could be eliminated from future analysis at OU1 However, like the monocyclic aromatics, there is little advantage in removing the ketones from the TCL volatile suite, and, therefore, ground-water and surface water samples will be analyzed for all TCL volatiles

Semivolatiles (acid extractables)

As shown in Tables 8 and 9, out of 41 analyses for acid extractables, there have only been three detections of phenol and isolated detections of 2-nitrophenol 4-nitrophenol, and 4-chloro-3-methylphenol within this analytical suite The three detections of phenol are all estimated at 1 $\mu g/\ell$ The action level for phenol

in water is 20,000 $\mu g/\ell$ The isolated occurrences of the other phenolic compounds are at estimated concentrations less than 3 $\mu g/\ell$ Although acid extractables have only been analyzed once at any given well or surface water station, there is no history of disposal of wastes containing acid extractable compounds Also, considering the infrequent spatial occurrence and very low concentrations of acid extractables, elimination of this analytical suite from future water monitoring at OU 1 is justified

Semivolatiles (base neutral extractables)

As shown in Tables 10 and 11, base/neutral extractables rarely occur in water at OU 1 The most frequently occurring compounds are phthalate esters, particularly bis(2-ethylhexyl) phthalate occurring at estimated concentrations below the detection limit, and near the action level of 3 $\mu g/\ell$ (Table 12) Phthalate esters are common laboratory contaminants, and bis(2-ethylhexyl)phthalate occurred in the blanks in one-half of the samples where this compound was detected ("B" qualifier)

N-nitrosodiphenylamine occurred second most frequently, however, this compound is also a known laboratory contaminant that leaches from the gas chromatograph column (Note the compound occurred in the laboratory blank in more than half the samples) Furthermore, the concentrations of N-nitrosodiphenylamine are below or near the health-based reference concentration (7 $\mu g/\ell$)

The remaining few base neutral extractable compounds that were detected all occurred at surface water station SW-67 With the exception of acenephthene and pyrene, the compounds were not present up or downgradient of this location, and are not present in soils or sediments at OU1 Acenaphthene and pyrene are not considered site contaminants originating from historical waste disposal activities at OU1 (see discussion of semivolatiles in soils/sediments) The presence of the remaining few base neutral extractable compounds at this location at very low (estimated) concentrations, and below the health-based reference concentrations (where available) is probably not significant

In general, none of the base neutral extractable compounds would be considered contaminants of concern from a human health risk assessment perspective owing to either their infrequent occurrence, low concentrations (estimated below detection limits), likelihood as a laboratory contaminant, or absence in soils and sediments Further analysis for base neutral extractable compounds is not warranted during the Phase III RFI/RI

Pesticides/PCBs

As shown in Tables 13, 14 and 15 pesticide occurrences in ground water and surface water are rare, and PCBs have never been observed The pesticides that were observed include parathion in well 2-87 and

endrin ketone in surface water stations SW-32, SW-33, and SW-34 The concentration of parathion is well below its action level, 200 $\mu g/\ell$ Because there is no record of disposal of pesticides at OU1, and pesticides occur infrequently and at low concentrations (PCBs have not been observed in water), the elimination of pesticide/PCB analysis from future ground-water and surface water monitoring at OU1 is justified

Soils and Sediments

Volatiles

As shown in Tables 16, 17 and 18, like ground water and surface water, certain volatile organics occur in soils and sediments with high frequency and at high concentrations As previously mentioned, the sampling technique for volatile organics has been modified to prevent volatile release during sample collection This likely explains the more frequent occurrence (and at higher concentrations) of toluene in samples from the french drain investigation (Table 17) relative to the previous RI investigation (Table 16) Although the monocyclic aromatics and the ketones appear to occur at concentrations far below their acceptable concentrations, the actual concentrations in soils within IHSSs is not known Elimination of monocyclic aromatics and ketones cannot be justified because the soil/sediment RI data is of little useability as a result of the sample collection issue Therefore, the full suite of TCL volatiles will be analyzed for these media during the Phase III investigation

Semivolatiles (acid extractables)

Out of 162 analyses for acid extractables, there are only three detections of chemicals in this class for soils/sediments at OU 1 (Tables 19, 20, and 21) At SED002, 4-methylphenol and benzoic acid were detected at estimated levels, and at SED030, phenol was detected at an estimated level The phenol concentration is far below its action level, and the absence of 4-methylphenol and benzoic acid in soil, ground water or surface water at OU1 implies the finding is not significant Although phenol is mobile in the environment, water quality data do not support that it is capable of migrating into ground water or surface water at concentrations that would exceed its acceptable concentration, i e , phenol was infrequently detected in the water, and only at 1 $\mu g/\ell$ However, as shown in Table 22, several waste source boreholes have been proposed in IHSSs because previous drilling did not penetrate these waste sources Therefore, these IHSSs are not chemically characterized and these waste source borehole samples will be analyzed for acid extractables However, other boreholes and sediment stations will not be analyzed for this class of compounds

Semivolatiles (base neutral extractables)

There are frequent occurrences of base neutral extractables in soils/sediments at OU 1 (Tables 23, 24, and 25) However, phthalate esters represent the majority of these occurrences The presence of phthalate esters in samples is surmised to be due to field contamination from handling the samples with plastic gloves Regardless, the concentrations of the phthalate esters are far below the acceptable concentration for bis(2-ethylhexyl) phthalate (assumed to be representative of the class) Also, phthalates are extremely immobile in the environment This is demonstrated by the site data that show the infrequent occurrence of phthalates in water at OU 1 Polynuclear aromatic hydrocarbons (PNAs) comprise the remainder of the occurrences of base neutral extractables in soils/sediments (Table 26) The occurrence of PNAs is infrequent, and with the exception of two samples (concentrations of 350 and 370 μg/kg), concentrations of PNAs are below the detection limit of 330 μg/kg Furthermore, of the boreholes where PNAs occur, only one borehole penetrates an IHSS (BH1287), and generally the PNAs are found in the composite samples that include the surface Therefore, it is not likely that PNAs are associated with past disposal of waste at OU1, and are more likely associated with PNA deposition in the environment from other sources, e g , burning of fossil fuels, fires, etc PNAs are also immobile in the environment which is supported by the OU1 water quality data Therefore, only those boreholes at OU1 that will penetrate IHSSs for the first time, will be analyzed for base neutral extractables

Pesticides/PCBs

Out of 161 analyses for pesticides/PCBs, there are only 3 occurrences of PCBs, and pesticides were not detected (Tables 27, 28, and 29) The concentrations of the PCBs are all below the action level of 90 μg/kg (Table 30), and occur ostensibly at random in three different boreholes Also, PCBs are immobile in the environment Therefore, only those boreholes at OU1 that will penetrate IHSSs for the first time will be analyzed for pesticides/PCBs

CONCLUSIONS

The conclusions presented above that delineate retaining or deleting analytical suites from future monitoring of environmental media at OU 1 are summarized in Table 31 and schematically presented in Figure 1 Elimination of certain analytical suites from future monitoring/characterization of the various media at this OU is well justified and will not compromise achieving the objectives of the Phase III RFI/RI The future investigation activities will provide better characterization of the extent of contamination for those contaminants that are significant from a waste disposal and human health risk perspective Only waste characterization within IHSSs at OU1 that were not previously investigated will include the full suite of TCL organics because of the current lack of soil/waste characterization data for these sources If semivolatiles or pesticides/PCBs

are detected at these IHSSs at significant levels, ground-water wells and surface water stations will be sampled and analyzed for these compounds at a later date, but prior to submittal of the Phase III RFI/RI report

Lastly, because CLP gas chromatograph/mass spectrometer (GC/MS) detection limits do not achieve "risk based" detection limits for some of the carcinogenic chlorinated solvents, EPA Method 502 2, which has detection limits as low as 0 5 $\mu g/\ell$, will be used for ground-water samples that are collected from wells near the edge of the plume All surface water samples downgradient of OU1 will also be analyzed for volatiles using EPA Method 502 2 These surface water stations and ground-water wells coincide with all stations and wells downgradient of the proposed location of the french drain

TABLE 1

CHEMICAL/PHYSICAL PARAMETERS AFFECTING
ENVIRONMENTAL FATE AND TRANSPORT
(See Notes)

Group A Compounds, TCL Volatile Organics

I Ketones & Aldehydes

Chemical	Molecular Weight g/mole	Specific Gravity g/cc	Vapor Pressure mmHg	H Dimension-less	Water Solubility mg/l	Log Kow c/c	Log Koc ml/g	Saturated Zone Rd	Mobility Index MI	Env Mobility
Acetone	55.1	0.1	270.00	0.013	60000.0	-0.24	-0 43	1 0	8	Extremely Mobile

II Monocyclic Aromatics

Chemical	Molecular Weight g/mole	Specific Gravity g/cc	Vapor Pressure mmHg	H Dimension-less	Water Solubility mg/l	Log Kow c/c	Log Koc ml/g	Saturated Zone Rd	Mobility Index MI	Env Mobility
Benzene	78 1	0 9	76 00	0.182	1780 0	2 13	1 81	6 8	3	Very Mobile
Toluene	92 1	0 9	22 00	0.214	515.0	2 79	2 48	28 0	2	Very Mobile
Ethyl Benzene	106 2	0 9	7	0.266	152.0	3 34	3.04	100 0	-0	Slightly Mobile
Xylene	106.2	0 9	10	0.380	152 0	3 13	2.11	12 6	1	Very Mobile

III Chlorinated Aliphatics

Chemical	Molecular Weight g/mole	Specific Gravity g/cc	Vapor Pressure mmHg	H Dimension-less	Water Solubility mg/l	Log Kow c/c	Log Koc ml/g	Saturated Zone Rd	Mobility Index MI	Env Mobility
Carbon Tetrachloride	153.8	1 6	90.00	0.960	785.0	2.96	2.64	40 5	2	Very Mobile
Trichloroethene	131.4	1 5	60.00	0 390	1100.0	2 42	2.10	12 3	3	Very Mobile
Chloroform	119.4	1 5	160 00	0.130	8000.0	1.97	1.64	4.9	4	Very Mobile
1,1,2,2-Trichloroethane	167.9	1 6	5 00	0.016	2900.0	2 39	2.07	11 6	2	Very Mobile

Group B Compounds, Semi Volatile Organics

IV Acid Extractables (Phenolics)

Chemical	Molecular Weight g/mole	Specific Gravity g/cc	Vapor Pressure mmHg	H Dimension-less	Water Solubility mg/l	Log Kow c/c	Log Koc ml/g	Saturated Zone Rd	Mobility Index MI	Env Mobility
Phenol	94 1	1 1	0.20	1 2E-04	8200 0	1.46	1 15	2.3	2	Very Mobile
Pentachlorophenol	266.4	2 0	1 1E-04	1 1E-04	14.0	5 18	4 72	4771.3	-8	Immobile
2,4 Dinitrophenol	184 1	1 7	1.5E-05	2.7E-08	5600 0	1.54	1 22	2 5	-2	Slightly Immobile
2,4,6-Trichlorophenol	197 5	1 5	0 012	1.6E-04	800 0	3.61	3 30	181 0	-2	Slightly Immobile

V Base-Neutral Extractables

Chemical	Molecular Weight g/mole	Specific Gravity g/cc	Vapor Pressure mmHg	H Dimension-less	Water Solubility mg/l	Log Kow c/c	Log Koc ml/g	Saturated Zone Rd	Mobility Index MI	Env Mobility
Bis(2-ethylhexyl)phthalate	391.1	1 0	2.7E-07	4 4E-06	1.3	9.61	9.30	1 8E+08	-16	Very Immobile
Chrysene	228.2	1.3	1.0E-11	6 9E-08	0.0	5 61	5.30	1.8E+04	-19	Very Immobile
1,2,4-Trichlorobenzene	181 5	1 5	0.29	9.6E-02	30	4.28	3.96	8.3E+02	-3	Slightly Immobile
1,3-Dichlorobenzene	147 0	1 3	2.28	1.5E-01	123	4.28	3 96	8.3E+02	-2	Slightly Immobile
Naphthalene	128.2	1.0	0 087	1.9E-02	31,7	3 29	2 97	8.6E+01	-3	Slightly Immobile
Benzo(a)pyrene	252.0	1 4	5 6E-09	2.0E-05	3.8E-03	6 06	6.74	5.0E+05	-17	Very Immobile

Group C Compounds, PCB's and Pesticides

VI PCB's

Chemical	Molecular Weight g/mole	Specific Gravity g/cc	Vapor Pressure mmHg	H Dimension-less	Water Solubility mg/l	Log Kow c/c	Log Koc ml/g	Saturated Zone Rd	Mobility Index MI	Env Mobility
PCB 1248	299.5	1.4	4.9E-04	1.5E-01	0.054	5.76	5.44	24931 0	-10	Immobile
PCB 1254	328 4	1 5	7 7E-05	4 6E-02	0.0	6 03	5 72	47233 7	-11	Very Immobile
PCB 1260	375 7	1 6	4 1E-05	2.8E-01	0.0	7 15	6 82	594625 1	-14	Very Immobile

VII Chlorinated Pesticides

Chemical	Molecular Weight g/mole	Specific Gravity g/cc	Vapor Pressure mmHg	H Dimension-less	Water Solubility mg/l	Log Kow c/c	Log Koc ml/g	Saturated Zone Rd	Mobility Index MI	Env Mobility
Dieldrin	381.0	1 8	1.8E-07	1 9E-05	0.2	3.54	3.23	153 8	-11	Very Immobile
DDT	375 7	1 6	1.9E-07	7.1E-04	5 5E-03	6 91	6.59	350141.6	-16	Very Immobile
Heptachlor	375.0	1.6	3 0E-04	3.4E-02	0.18	4.4	4 1	1081.0	-8	Immobile
Lindane	291.0	1 6	2.5E-05	2.5E-04	1 6	3 9	3 6	343 0	-8	Immobile
Chlordane	409.8	1 6	1.0E-05	4 0E-03	0.056	5.5	5 1	12601.0	-11	Very Immobile
Toxaphene	414.0	1 6	0 3	1.4E+01	0.5	3.3	3 0	87.8	-4	

TABLE 2

SUMMARY OF ENVIRONMENTAL
INTER-MEDIA MIGRATION
CHARACTERISTICS

Inter-Media Migration Characteristic	Aldehydes & Ketones	Monocyclic Aromatics	Chlorinated Aliphatics	Acid Extractables	Base-Neutral Extractables	PCB's	Pesticides
Soil to Groundwater	Yes	Yes	Yes	Yes	No	No	No
Soil or Soil Water to Air	No	Yes	Yes	No	No	No	No
Migration in Groundwater	Yes	Yes	Yes	Yes	No	No	No

TABLE 3

HEALTH-BASED REFERENCE CONTAMINANT CONCENTRATIONS

COMPOUND	MCL (µg/ℓ)	RCRA ACTION LEVEL	
		WATER (µg/ℓ)	SOIL (µg/kg)
Volatiles			
Benzene	5		
Ethylbenzene	700		8,000,000
Toluene	1,000		20,000,000
Xylene	10,000		
200,000,000			
Acetone		4,000	8,000,000
2-Butanone		2,000	4,000,000
Semivolatiles			
Bis(2-ethylhexyl)phthalate		3	50,000
Phenol		20,000	50,000,000
Pentachlorophenol		1,000	2,000,000
N-Nitrosodiphenylamine		7	100,000
1,2,4-Trichlorobenzene		700	2,000,000
1,4-Dichlorobenzene	7 5		
PCBs and Pesticides			
PCBs			90
Parathion		200	

TABLE 4

OU1 Boreholes, Ground-Water Wells,
Surface Water and Sediment Stations

Boreholes	Ground-Water Wells	Surface Water Stations	Sediment Stations
1987 Investigation	Alluvial/Colluvial		
BH0187	0187	SW031	SD001
BH0287	5187	SW032	SD002
BH0387	5287	SW033	SD025
BH0487	0974	SW034	SD026
BH0587	1074	SW044	SD027
BH0687	6386	SW045	SD028
BH0787	6986	SW046	SD029
BH0887	0287	SW066	SD030
BH0987	0487	SW067	SD031
BH1087	0687	SW068	
BH1187	4387	SW069	
BH1287	4487	SW070	
BH1387	4787	SW071	
BH1487	4887	SW072	
BH1587	4987	SW126	
BH1687	5087		
BH1787	5387		
BH5787	5487		
BH5887	5986R		
BH5976	6486		
BH6187	6886		
BH6287	5587		
BH6387	5886		
French Drain Investigation	Bedrock		
0190-4290	5986		
	6286		
	0587BR		
	0387BR		
	4587BR		
	0887BR		

TABLE 5

Summary of Detected Compounds for
Operable Unit No. 1
Phase I and Phase II RIs

Matrix Soil/Sediment

Analytical Suite	Hits / Analyses	Case	Comment
Pesticides/PCBs	3 / 4232	2	No History of Release at the Site
Acid Extractables	3 / 2572	1	No History of Release at the Site
Base-Neutral Extractables	208 / 8184	2	No History of Release at the Site Extremely Immobile in Soils
Volatile Organic Compounds	361 / 4955	3	Assumed to be Site-Related

Matrix Ground Water/Surface Water

Analytical Suite	Hits / Analyses	Case	Comment
Pesticides/PCBs	4 / 1277	1	No History of Release at the Site
Acid Extractables	6 / 656	1	No History of Release at the Site
Base-Neutral Extractables	28 / 2192	2	No History of Release at the Site Extremely Immobile in Saturated
Volatile Organic Compounds	773 / 14,898	3	Assumed to be Site-Related

TABLE 7

OU1 SURFACE WATER VOA SUMMARY

Q	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,1,1-TRICHLOROETHANE	231	2	4	UG/L	2.5000
[illegible]	1,1,2,2-TETRACHLOROETHANE	231	0			
[illegible]	1,1,2-TRICHLOROETHANE	231	0	.		.
4	1,1-DICHLOROETHANE	231	0			
[illegible]	1,1-DICHLOROETHENE	219	0			.
[illegible]	1,2-DICHLOROETHANE	231	0			.
7	1,2-DICHLOROETHYLENE	212	0			.
[illegible]	1,2-DICHLOROPROPANE	231	0			.
[illegible]	2-BUTANONE	237	23	24	UG/L	5.8261
10	2-HEXANONE	231	1	1	UG/L	1.0000
11	4-METHYL-2-PENTANONE	231	0	.		.
[illegible]	ACETONE	237	79	28	UG/L	5.3924
[illegible]	BENZENE	219	0			
14	BROMODICHLOROMETHANE	231	0	.		
[illegible]	BROMOFORM	231	0	.		
[illegible]	BROMOMETHANE	231	0	.		.
17	CARBON DISULFIDE	231	1	1	UG/L	1.0000
18	CARBON TETRACHLORIDE	231	2	6	UG/L	4 0000
[illegible]	CHLOROBENZENE	219	0	.		.
20	CHLOROETHANE	231	0	.		.
21	CHLOROFORM	231	2	1	UG/L	1.0000
[illegible]	CHLOROMETHANE	231	2	2	UG/L	2 0000
[illegible]	DIBROMOCHLOROMETHANE	231	0	.		.
24	ETHYLBENZENE	231	0	.		.
25	METHYLENE CHLORIDE	242	131	38	UG/L	5.9542
[illegible]	STYRENE	231	0	.		.
27	TETRACHLOROETHENE	231	8	16	UG/L	3.3750
28	TOLUENE	219	5	12	UG/L	4.0000
[illegible]	TOTAL XYLENES	231	1	1	UG/L	1.0000
[illegible]	TRICHLOROETHENE	219	5	26	UG/L	10.0000
31	VINYL ACETATE	231	3	2	UG/L	1.3333
[illegible]	VINYL CHLORIDE	231	0	.		.
[illegible]	cis-1,3-DICHLOROPROPENE	231	0	.		
34	trans-1,2-DICHLOROETHENE	19	0			
35	trans-1,3-DICHLOROPROPENE	231	0			
		7817	265			

TABLE 8

OU1 GROUND WATER ACID EXTRACTABLE SUMMARY

S	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	2,4,5-TRICHLOROPHENOL	3	0			.
2	2,4,6-TRICHLOROPHENOL	3	0			.
3	2,4-DICHLOROPHENOL	3	0	.		
4	2,4-DIMETHYLPHENOL	3	0	.		
5	2,4-DINITROPHENOL	3	0	.		.
6	2-CHLOROPHENOL	3	0			.
7	2-METHYLPHENOL	3	0			.
8	2-NITROPHENOL	3	1	3	UG/L	3
9	4,6-DINITRO-2-METHYLPHENOL	3	0			
10	4-CHLORO-3-METHYLPHENOL	3	0	.		.
11	4-METHYLPHENOL	3	0	.		.
12	4-NITROPHENOL	3	1	2	UG/L	2
13	BENZOIC ACID	3	0	.		.
14	BENZYL ALCOHOL	3	0	.		.
15	PENTACHLOROPHENOL	3	0	.		.
16	PHENOL	3	1	1	UG/L	1
		48	3			

TABLE 9

OU1 SURFACE WATER ACID EXTRACTABLE SUMMARY

	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	2,4,5-TRICHLOROPHENOL	38	0			.
2	2,4,6-TRICHLOROPHENOL	38	0			
3	2,4-DICHLOROPHENOL	38	0	.		.
4	2,4-DIMETHYLPHENOL	38	0	.		
5	2,4-DINITROPHENOL	38	0	.		.
6	2-CHLOROPHENOL	38	0			
7	2-METHYLPHENOL	38	0	.		.
8	2-NITROPHENOL	38	0	.		.
9	4,6-DINITRO-2-METHYLPHENOL	38	0			
10	4-CHLORO-3-METHYLPHENOL	38	1	1	UG/L	1
11	4-METHYLPHENOL	38	0			
12	4-NITROPHENOL	38	0			
13	BENZOIC ACID	38	0			
14	BENZYL ALCOHOL	38	0			.
15	PENTACHLOROPHENOL	38	0			.
16	PHENOL	38	2	1	UG/L	1
		608	3			

TABLE 10

OU1 GROUND WATER BASE NEUTRAL EXTRACTABLE SUMMARY

S	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,2,4-TRICHLOROBENZENE	3	0	.		.
2	1,2-DICHLOROBENZENE	3	0			.
3	1,3-DICHLOROBENZENE	3	0	.		.
4	1,4-DICHLOROBENZENE	3	0	.		.
5	2,4-DINITROTOLUENE	3	0	.		.
6	2,6-DINITROTOLUENE	3	0	.		
7	2-CHLOROETHYL VINYL ETHER	76	0	.		.
8	2-CHLORONAPHTHALENE	3	0			.
9	2-METHYLNAPHTHALENE	3	0			.
10	2-NITROANILINE	3	0	.		.
11	3,3'-DICHLOROBENZIDINE	3	0			.
2	3-NITROANILINE	3	0			.
3	4-BROMOPHENYL PHENYL ETHER	3	0			.
14	4-CHLOROANILINE	3	0	.		.
5	4-CHLOROPHENYL PHENYL ETHER	3	0	.		.
6	4-NITROANILINE	3	0	.		
17	ACENAPHTHENE	3	0			.
18	ACENAPHTHYLENE	3	0	.		.
9	ANTHRACENE	3	0	.		.
20	BENZO(a)ANTHRACENE	3	0			.
21	BENZO(a)PYRENE	3	0	.		.
2	BENZO(b)FLUORANTHENE	3	0	.		.
3	BENZO(ghi)PERYLENE	3	0	.		.
24	BENZO(k)FLUORANTHENE	3	0	.		.
5	BIS(2-CHLOROETHOXY)METHANE	3	0	.		.
6	BIS(2-CHLOROETHYL)ETHER	3	0	.		.
27	BIS(2-CHLOROISOPROPYL)ETHER	3	0	.		.
28	BIS(2-ETHYLHEXYL)PHTHALATE	3	2	15	UG/L	8
9	BUTYL BENZYL PHTHALATE	3	0			.
30	CHRYSENE	3	0			.
31	DI-n-BUTYL PHTHALATE	3	1	1	UG/L	1
2	DI-n-OCTYL PHTHALATE	3	0	.		.
3	DIBENZO(a,h)ANTHRACENE	3	0			.
34	DIBENZOFURAN	3	0	.		.
5	DIETHYL PHTHALATE	3	0	.		.
6	DIMETHYL PHTHALATE	3	0	.		
37	FLUORANTHENE	3	0	.		.
38	FLUORENE	3	0			
9	HEXACHLOROBENZENE	3	0	.		.
40	HEXACHLOROBUTADIENE	3	0	.		.
41	HEXACHLOROCYCLOPENTADIENE	3	0			.
2	HEXACHLOROETHANE	3	0			
3	INDENO(1,2,3-cd)PYRENE	3	0	.		.
44	ISOPHORONE	3	0			
45	N-NITROSO-DI-n-PROPYLAMINE	3	0			.
6	N-NITROSODIPHENYLAMINE	3	2	12	UG/L	10
47	NAPHTHALENE	3	0			.
48	NITROBENZENE	3	0			.
9	PHENANTHRENE	3	0			
0	PYRENE	3	0			
		223	5			

TABLE 11

OU1 SURFACE WATER BASE NEUTRAL EXTRACTABLE SUMMARY

S	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,2,4-TRICHLOROBENZENE	38	1	4	UG/L	4.00000
2	1,2-DICHLOROBENZENE	38	0	.		.
3	1,2-DIMETHYLBENZENE	41	0			.
4	1,3-DICHLOROBENZENE	38	0			
5	1,4-DICHLOROBENZENE	38	1	4	UG/L	4.00000
6	2,4-DINITROTOLUENE	38	1	4	UG/L	4.00000
7	2,6-DINITROTOLUENE	38	0			.
8	2-CHLOROETHYL VINYL ETHER	66	0			.
9	2-CHLORONAPHTHALENE	38	0	.		
10	2-METHYLNAPHTHALENE	38	0	.		.
11	2-NITROANILINE	38	0	.		.
12	3,3'-DICHLOROBENZIDINE	38	0	.		.
13	3-NITROANILINE	38	0			.
14	4-BROMOPHENYL PHENYL ETHER	38	0			.
15	4-CHLOROANILINE	38	0			.
16	4-CHLOROPHENYL PHENYL ETHER	38	0	.		
17	4-NITROANILINE	38	0			.
18	ACENAPHTHENE	38	1	5	UG/L	5.00000
19	ACENAPHTHYLENE	38	0			.
20	ANTHRACENE	38	0			.
21	BENZO(a)ANTHRACENE	38	0			
22	BENZO(a)PYRENE	38	0			.
23	BENZO(b)FLUORANTHENE	38	0			.
24	BENZO(ghi)PERYLENE	38	0			.
25	BENZO(k)FLUORANTHENE	38	0	.		.
26	BIS(2-CHLOROETHOXY)METHANE	38	0	.		.
27	BIS(2-CHLOROETHYL)ETHER	38	0	.		.
28	BIS(2-CHLOROISOPROPYL)ETHER	38	0	.		.
29	BIS(2-ETHYLHEXYL)PHTHALATE	38	12	4	UG/L	1.91667
30	BUTYL BENZYL PHTHALATE	38	0			.
31	CHRYSENE	38	0	.		.
32	DI-n-BUTYL PHTHALATE	38	0	.		.
33	DI-n-OCTYL PHTHALATE	38	0	.		.
34	DIBENZO(a,h)ANTHRACENE	38	0	.		.
35	DIBENZOFURAN	38	0			
36	DIETHYL PHTHALATE	38	0	.		.
37	DIMETHYL PHTHALATE	38	0	.		.
38	FLUORANTHENE	38	0	.		.
39	FLUORENE	38	0			.
40	HEXACHLOROBENZENE	38	0			.
41	HEXACHLOROBUTADIENE	38	0	.		.
42	HEXACHLOROCYCLOPENTADIENE	38	0	.		
43	HEXACHLOROETHANE	38	0	.		
44	INDENO(1,2,3-cd)PYRENE	38	0			
45	ISOPHORONE	38	0			
46	N-NITROSO-DI-n-PROPYLAMINE	38	1	5	UG/L	5.00000
47	N-NITROSODIPHENYLAMINE	38	5	9	UG/L	5.00000
48	NAPHTHALENE	38	0			
49	NITROBENZENE	38	0			
50	PHENANTHRENE	38	0			
51	PYRENE	38	1	4	UG/L	4 00000
		1969	23			

TABLE 12

OU1 SURFACE WATER AND GROUNDWATER BASE NEUTRAL EXTRACTABLE COMPOUND OCCURRENCES

LOCATION	SAMPLE NUMBER	ANALYTE	CONCENTRATION	UNIT	QUALIFIER	DETECTION LIMIT	VALIDATION CODE	COLLECTION DATE
SURFACE WATER								
SW067	SW067007	1,2,4-TRICHLOROBENZENE	4	UG/L	J	10		24-OCT-89
SW067	SW067007	1,4-DICHLOROBENZENE	4	UG/L	J	10		24-OCT-89
SW067	SW067007	2,4-DINITROTOLUENE	4	UG/L	J	10		24-OCT-89
SW067	SW067007	ACENAPHTHENE	5	UG/L	J	10		24-OCT-89
SW031	SW031007	BIS(2-ETHYLHEXYL)PHTHALATE	2	UG/L	JB	10		24-OCT-89
SW032	SW032007	BIS(2-ETHYLHEXYL)PHTHALATE	1	UG/L	JB	10		13-OCT-89
SW033	SW033007	BIS(2-ETHYLHEXYL)PHTHALATE	1	UG/L	JB	10		13-OCT-89
SW046	SW046007	BIS(2-ETHYLHEXYL)PHTHALATE	1	UG/L	J	10	A	19-OCT-89
SW066	SW066001	BIS(2-ETHYLHEXYL)PHTHALATE	1	UG/L	J	10		29-MAR-89
SW066	SW066002	BIS(2-ETHYLHEXYL)PHTHALATE	3	UG/L	J	10		17-MAY-89
SW066	SW066007	BIS(2-ETHYLHEXYL)PHTHALATE	2	UG/L	JB	10		24-OCT-89
SW067	SW067007	BIS(2-ETHYLHEXYL)PHTHALATE	2	UG/L	JB	10		24-OCT-89
SW068	SW068007	BIS(2-ETHYLHEXYL)PHTHALATE	3	UG/L	JB	10		24-OCT-89
SW069	SW069007	BIS(2-ETHYLHEXYL)PHTHALATE	4	UG/L	J	10	A	23-OCT-89
SW070	SW070001	BIS(2-ETHYLHEXYL)PHTHALATE	2	UG/L	J	10		29-MAR-89
SW070	SW070007D	BIS(2-ETHYLHEXYL)PHTHALATE	1	UG/L	J	10	A	23-OCT-89
SW067	SW067007	N-NITROSO-DI-n-PROPYLAMINE	5	UG/L	J	10		24-OCT-89
SW031	SW31088600	N-NITROSODIPHENYLAMINE	9	UG/L	JB	10	N	
SW032	SW032007	N-NITROSODIPHENYLAMINE	1	UG/L	J	10		13-OCT-89
SW032	SW32088600	N-NITROSODIPHENYLAMINE	5	UG/L	JB	10	N	
SW034	SW034007	N-NITROSODIPHENYLAMINE	1	UG/L	J	10		13-OCT-89
SW034	SW34088600	N-NITROSODIPHENYLAMINE	9	UG/L	JB	10	N	
SW067	SW067007	PYRENE	4	UG/L	J	10		24-OCT-89
GROUND WATER								
0487	4-87	BIS(2-ETHYLHEXYL)PHTHALATE	15 00	UG/L	B		N	14-OCT-87
6886	G688609860	BIS(2-ETHYLHEXYL)PHTHALATE	1	UG/L	J	10	N	
6886	G688609860	DI-n-BUTYL PHTHALATE	1	UG/L	J	10	N	
0974	G097408860	N-NITROSODIPHENYLAMINE	12	UG/L	B	10	N	
6886	G688609860	N-NITOSODIPHENYLAMINE	8	UG/L	J	10	N	

TABLE 13

OU1 GROUND WATER PESTICIDE/PCB SUMMARY

IS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	4,4'-DDD	4	0			.
2	4,4'-DDE	4	0	.		.
3	4,4'-DDT	4	0			.
4	ALDRIN	4	0	.		
5	AROCLOR-1016	4	0			.
6	AROCLOR-1221	4	0			
7	AROCLOR-1232	4	0			
8	AROCLOR-1242	4	0			
9	AROCLOR-1248	4	0			
10	AROCLOR-1254	4	0	.		
11	AROCLOR-1260	4	0	.		.
12	CHLORDANE	4	0			
13	DIELDRIN	4	0	.		
14	ENDOSULFAN I	4	0			
15	ENDOSULFAN II	4	0	.		
16	ENDOSULFAN SULFATE	4	0	.		
17	ENDRIN	4	0	.		
18	ENDRIN KETONE	4	0			
19	HEPTACHLOR	4	0	.		
20	HEPTACHLOR EPOXIDE	4	0	.		.
21	HEXAVALENT CHROMIUM	4	0			
22	METHOXYCHLOR	4	0	.		
23	PARATHION, ETHYL	13	1	0.06	UG/L	0.06
24	TOXAPHENE	4	0	.		.
25	alpha-BHC	4	0	.		.
26	beta-BHC	4	0	.		.
27	delta-BHC	4	0	.		.
28	gamma-BHC (LINDANE)	4	0	.		.
		121	1			

TABLE 14

OU1 SURFACE WATER PESTICIDE/PCB SUMMARY

S	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	4,4'-DDD	42	0			.
2	4,4'-DDE	42	0	.		.
3	4,4'-DDT	42	0	.		.
4	ALDRIN	42	0			
5	AROCLOR-1016	42	0			.
6	AROCLOR-1221	42	0			.
7	AROCLOR-1232	42	0			.
8	AROCLOR-1242	42	0			.
9	AROCLOR-1248	42	0			
10	AROCLOR-1254	42	0	.		.
11	AROCLOR-1260	42	0	.		.
12	CHLORDANE	3	0			
13	DIELDRIN	42	0			
14	ENDOSULFAN I	42	0			
15	ENDOSULFAN II	42	0	.		.
16	ENDOSULFAN SULFATE	42	0			.
17	ENDRIN	42	0			.
18	ENDRIN KETONE	42	3	0.5	UG/L	0.23333
19	HEPTACHLOR	42	0	.		.
20	HEPTACHLOR EPOXIDE	42	0	.		.
21	HEXAVALENT CHROMIUM	7	0	.		
22	METHOXYCHLOR	42	0			
23	PARATHION, ETHYL	18	0	.		.
24	TOXAPHENE	42	0			.
25	alpha-BHC	42	0			.
26	alpha-CHLORDANE	39	0	.		.
27	beta-BHC	42	0			.
28	delta-BHC	42	0	.		.
29	gamma-BHC (LINDANE)	42	0	.		.
30	gamma-CHLORDANE	39	0			.
		1156	3			

TABLE 15
OU1 SURFACE WATER AND GROUND WATER PESTICIDE/PCB COMPOUND OCCURRENCES

LOCATION	SAMPLE NUMBER	ANALYTE	CONCENTRATION	UNIT	QUALIFIER	DETECTION LIMIT	VALIDATION CODE	COLLECTION DATE
SURFACE WATER								
SW032	SW032002	ENDRIN KETONE	0 10	UG/L	UJ	A 0 10	A	24-MAY-89
SW033	SW033002	ENDRIN KETONE	0 10	UG/L	UJ	A 0 10	A	24-MAY-89
SW034	SW034002	ENDRIN KETONE	0 50	UG/L	UJ	A 0 50	A	24-MAY-89
GROUND WATER								
0287	GW009291T	PARATHION, ETHYL	0 06	UG/L		0 01		07-MAR-91

TABLE 16

OU1 SOIL VOA SUMMARY

S	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,1,1-TRICHLOROETHANE	87	13	110	UG/KG	34.385
2	1,1,2,2-TETRACHLOROETHANE	87	0	.		.
3	1,1,2-TRICHLOROETHANE	87	3	27	UG/KG	13.667
4	1,1-DICHLOROETHANE	87	0			.
5	1,1-DICHLOROETHENE	87	1	8	UG/KG	8.000
6	1,2-DICHLOROETHANE	87	2	10	UG/KG	7.500
7	1,2-DICHLOROPROPANE	87	0			.
8	2-BUTANONE	87	29	390	UG/KG	94.172
9	2-HEXANONE	87	0			.
10	4-METHYL-2-PENTANONE	87	1	68	UG/KG	68.000
11	ACETONE	87	77	650	UG/KG	125.273
12	BENZENE	86	0			.
13	BROMODICHLOROMETHANE	87	0	.		.
14	BROMOFORM	87	0	.		.
15	BROMOMETHANE	87	1	6	UG/KG	6 000
16	CARBON DISULFIDE	87	0			
17	CARBON TETRACHLORIDE	87	0			
18	CHLOROBENZENE	87	0			
19	CHLOROETHANE	87	0			.
20	CHLOROFORM	87	0			.
21	CHLOROMETHANE	87	0			.
22	DIBROMOCHLOROMETHANE	87	0			.
23	ETHYLBENZENE	87	0	.		.
24	METHYLENE CHLORIDE	87	85	590	UG/KG	42.801
25	STYRENE	87	0			.
26	TETRACHLOROETHENE	87	8	190	UG/KG	62.750
27	TOLUENE	87	2	25	UG/KG	15.500
28	TOTAL XYLENES	87	0	.		.
29	TRICHLOROETHENE	87	25	150	UG/KG	22.948
30	VINYL ACETATE	87	0	.		
31	VINYL CHLORIDE	87	0	.		.
32	cis-1,3-DICHLOROPROPENE	87	0	.		.
33	trans-1,2-DICHLOROETHENE	87	1	18	UG/KG	18.000
34	trans-1,3-DICHLOROPROPENE	87	0	.		.
		2957	248			

TABLE 17

OU1 FRENCH DRAIN INVESTIGATION VOA SUMMARY

C	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,1,1-TRICHLOROETHANE	20	0	.		
2	1,1,2,2-TETRACHLOROETHANE	20	0	.		.
3	1,1,2-TRICHLOROETHANE	20	0	.		.
4	1,1-DICHLOROETHANE	20	0			
5	1,1-DICHLOROETHENE	18	0			.
6	1,2-DICHLOROETHANE	20	0			.
7	1,2-DICHLOROETHYLENE	20	0			.
8	1,2-DICHLOROPROPANE	20	0			
9	2-BUTANONE	20	4	12	UG/L	5.500
10	2-HEXANONE	20	0	.		.
11	4-METHYL-2-PENTANONE	20	1	3	UG/L	3.000
12	ACETONE	21	6	10	UG/L	6 333
13	BENZENE	18	0			.
14	BROMODICHLOROMETHANE	20	0			.
15	BROMOFORM	20	0	.		.
16	BROMOMETHANE	20	0			.
17	CARBON DISULFIDE	20	0			.
18	CARBON TETRACHLORIDE	20	0			
19	CHLOROBENZENE	18	0	.		.
20	CHLOROETHANE	20	0	.		.
21	CHLOROFORM	20	0			.
22	CHLOROMETHANE	20	0			.
23	DIBROMOCHLOROMETHANE	20	0	.		
24	ETHYLBENZENE	20	0	.		.
25	METHYLENE CHLORIDE	21	12	26	UG/L	6.917
26	STYRENE	20	0			.
27	TETRACHLOROETHENE	20	0	.		.
28	TOLUENE	18	18	860	UG/L	225.111
29	TOTAL XYLENES	20	0			.
30	TRICHLOROETHENE	18	0			.
31	VINYL ACETATE	20	0	.		.
32	VINYL CHLORIDE	20	0	.		.
33	cis-1,3-DICHLOROPROPENE	20	0			.
34	trans-1,3-DICHLOROPROPENE	20	0			.
		672	41			

TABLE 18

OU1 SEDIMENT VOA SUMMARY

S	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,1,1-TRICHLOROETHANE	39	1	3	UG/KG	3.0000
2	1,1,2,2-TETRACHLOROETHANE	39	0			.
3	1,1,2-TRICHLOROETHANE	39	0			
4	1,1-DICHLOROETHANE	39	0	.		
5	1,1-DICHLOROETHENE	39	0	.		
6	1,2-DICHLOROETHANE	39	0			
7	1,2-DICHLOROETHYLENE	37	0			
8	1,2-DICHLOROPROPANE	39	0			
9	2-BUTANONE	39	2	100	UG/KG	58.0000
10	2-HEXANONE	39	0			.
11	4-METHYL-2-PENTANONE	39	0			.
12	ACETONE	39	23	480	UG/KG	68.8696
13	BENZENE	39	0			.
14	BROMODICHLOROMETHANE	39	0	.		.
15	BROMOFORM	39	0	.		.
16	BROMOMETHANE	39	0	.		.
17	CARBON DISULFIDE	39	1	6	UG/KG	6 0000
18	CARBON TETRACHLORIDE	39	0	.		.
19	CHLOROBENZENE	39	0	.		.
20	CHLOROETHANE	39	0			.
21	CHLOROFORM	39	1	18	UG/KG	18.0000
22	CHLOROMETHANE	39	3	60	UG/KG	46.3333
23	DIBROMOCHLOROMETHANE	39	0			.
24	ETHYLBENZENE	39	1	4	UG/KG	4.0000
25	METHYLENE CHLORIDE	39	27	54	UG/KG	13.2593
26	STYRENE	39	0			
27	TETRACHLOROETHENE	39	0	.		.
28	TOLUENE	39	9	59	UG/KG	9.0000
29	TOTAL XYLENES	39	0			.
30	TRICHLOROETHENE	39	4	8	UG/KG	5.7500
31	VINYL ACETATE	39	0			.
32	VINYL CHLORIDE	39	0			
33	cis-1,3-DICHLOROPROPENE	39	0	.		.
34	trans-1,2-DICHLOROETHENE	2	0	.		.
35	trans-1,3-DICHLOROPROPENE	39	0	.		.
		1326	72			

TABLE 19

OU1 SOIL ACID EXTRACTABLE SUMMARY

O	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	2,4,5-TRICHLOROPHENOL	90	0	.		.
	2,4,6-TRICHLOROPHENOL	90	0			.
	2,4-DICHLOROPHENOL	90	0	.		.
4	2,4-DIMETHYLPHENOL	90	0	.		.
	2,4-DINITROPHENOL	90	0	.		.
	2-CHLOROPHENOL	90	0			.
7	2-METHYLPHENOL	90	0	.		.
8	2-NITROPHENOL	90	0	.		.
	4,6-DINITRO-2-METHYLPHENOL	90	0			
	4-CHLORO-3-METHYLPHENOL	90	0	.		
11	4-METHYLPHENOL	90	0			.
	4-NITROPHENOL	90	0			
	BENZOIC ACID	90	0	.		.
14	BENZYL ALCOHOL	90	0	.		
	PENTACHLOROPHENOL	90	0	.		.
	PHENOL	90	0			.
		1440	0			

TABLE 20

OU1 FRENCH DRAIN INVESTIGATION ACID EXTRACTABLE SUMMARY

S	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	2,4,5-TRICHLOROPHENOL	55	0			.
2	2,4,6-TRICHLOROPHENOL	55	0			.
3	2,4-DICHLOROPHENOL	55	0			
4	2,4-DIMETHYLPHENOL	55	0			.
5	2,4-DINITROPHENOL	55	0			.
6	2-CHLOROPHENOL	51	0			
7	2-METHYLPHENOL	55	0			.
8	2-NITROPHENOL	55	0			.
9	4,6-DINITRO-2-METHYLPHENOL	55	0			.
10	4-CHLORO-3-METHYLPHENOL	51	0			.
11	4-METHYLPHENOL	55	0			.
12	4-NITROPHENOL	51	0			.
13	BENZOIC ACID	55	0			.
14	BENZYL ALCOHOL	55	0			.
15	PENTACHLOROPHENOL	51	0			.
16	PHENOL	51	0			.
		860	0			

TABLE 21

OU1 SEDIMENT ACID EXTRACTABLE SUMMARY

S	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	2,4,5-TRICHLOROPHENOL	17	0			
2	2,4,6-TRICHLOROPHENOL	17	0	.		
3	2,4-DICHLOROPHENOL	17	0	.		
4	2,4-DIMETHYLPHENOL	17	0			.
5	2,4-DINITROPHENOL	17	0			.
6	2-CHLOROPHENOL	17	0			
7	2-METHYLPHENOL	17	0			
8	2-NITROPHENOL	17	0			
9	4,6-DINITRO-2-METHYLPHENOL	17	0			
10	4-CHLORO-3-METHYLPHENOL	17	0			
11	4-METHYLPHENOL	17	1	2200	UG/KG	2200
12	4-NITROPHENOL	17	0			.
13	BENZOIC ACID	17	1	390	UG/KG	390
14	BENZYL ALCOHOL	17	0	.		.
15	PENTACHLOROPHENOL	17	0	.		.
16	PHENOL	17	1	650	UG/KG	650
		272	3			

TABLE 23

OU1 SOIL BASE NEUTRAL EXTRACTABLE SUMMARY

	ANALYTE	RAWCOUNT	NITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,2,4-TRICHLOROBENZENE	90	0			
2	1,2-DICHLOROBENZENE	90	0			
3	1,3-DICHLOROBENZENE	90	0	.		.
4	1,4-DICHLOROBENZENE	90	0			
5	2,4-DINITROTOLUENE	90	0	.		.
6	2,6-DINITROTOLUENE	90	0			
7	2-CHLOROETHYL VINYL ETHER	87	0			.
8	2-CHLORONAPHTHALENE	90	0			.
9	2-METHYLNAPHTHALENE	90	0	.		
10	2-NITROANILINE	90	0	.		
11	3,3'-DICHLOROBENZIDINE	90	0			.
12	3-NITROANILINE	90	0			.
13	4-BROMOPHENYL PHENYL ETHER	90	0			
14	4-CHLOROANILINE	90	0			
15	4-CHLOROPHENYL PHENYL ETHER	90	0	.		.
16	4-NITROANILINE	90	0	.		.
17	ACENAPHTHENE	90	2	57	UG/KG	57 00
18	ACENAPHTHYLENE	90	0	.		.
19	ANTHRACENE	90	4	81	UG/KG	59.50
20	BENZO(a)ANTHRACENE	90	4	110	UG/KG	74.00
21	BENZO(a)PYRENE	90	1	130	UG/KG	130.00
22	BENZO(b)FLUORANTHENE	90	4	89	UG/KG	67.50
23	BENZO(ghi)PERYLENE	90	1	50	UG/KG	50.00
24	BENZO(k)FLUORANTHENE	90	3	180	UG/KG	97.67
25	BIS(2-CHLOROETHOXY)METHANE	90	0	.		
26	BIS(2-CHLOROETHYL)ETHER	90	0	.		.
27	BIS(2-CHLOROISOPROPYL)ETHER	90	0	.		.
28	BIS(2-ETHYLHEXYL)PHTHALATE	90	88	7214	UG/KG	1255.05
29	BUTYL BENZYL PHTHALATE	90	0	.		.
30	CHRYSENE	90	4	150	UG/KG	88.75
31	DI-n-BUTYL PHTHALATE	90	22	3643	UG/KG	1078.86
32	DI-n-OCTYL PHTHALATE	90	2	250	UG/KG	210.00
33	DIBENZO(a,h)ANTHRACENE	90	0	.		.
34	DIBENZOFURAN	90	0			
35	DIETHYL PHTHALATE	90	0			.
36	DIMETHYL PHTHALATE	90	0	.		.
37	FLUORANTHENE	90	5	350	UG/KG	238.00
38	FLUORENE	90	2	55	UG/KG	54.50
39	HEXACHLOROBENZENE	90	0	.		.
40	HEXACHLOROBUTADIENE	90	0			.
41	HEXACHLOROCYCLOPENTADIENE	90	0			.
42	HEXACHLOROETHANE	90	0			.
43	INDENO(1,2,3-cd)PYRENE	90	1	47	UG/KG	47.00
44	ISOPHORONE	90	0			
45	N-NITROSO-DI-n-PROPYLAMINE	90	0			
46	N-NITROSODIPHENYLAMINE	90	23	160	UG/KG	78 91
47	NAPHTHALENE	90	0			
48	NITROBENZENE	90	0			
49	PHENANTHRENE	90	6	370	UG/KG	199 50
50	PYRENE	90	5	270	UG/KG	202 00
		4497	177			

TABLE 24

OU1 FRENCH DRAIN INVESTIGATION BASE NEUTRAL EXTRACTABLE SUMMARY

OBS	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,2,4-TRICHLOROBENZENE	51	0			
2	1,2-DICHLOROBENZENE	55	0			
3	1,2-DIMETHYLBENZENE	15	0			
4	1,3-DICHLOROBENZENE	55	0			
5	1,4-DICHLOROBENZENE	51	0			
6	2,4-DINITROTOLUENE	51	0			
7	2,6-DINITROTOLUENE	55	0			
8	2-CHLOROETHYL VINYL ETHER	15	0			
9	2-CHLORONAPHTHALENE	55	0			
10	2-METHYLNAPHTHALENE	55	0			
11	2-NITROANILINE	55	0			
12	3,3'-DICHLOROBENZIDINE	55	0			
13	3-NITROANILINE	55	0			
14	4-BROMOPHENYL PHENYL ETHER	55	0			
15	4-CHLOROANILINE	55	0			
16	4-CHLOROPHENYL PHENYL ETHER	55	0			
17	4-NITROANILINE	55	0			
18	ACENAPHTHENE	51	0			
19	ACENAPHTHYLENE	55	0			
20	ANTHRACENE	55	0	.		
21	BENZENAMINE	53	0			
22	BENZIDINE	53	0			
23	BENZO(a)ANTHRACENE	55	0			
24	BENZO(a)PYRENE	55	0			
25	BENZO(b)FLUORANTHENE	55	0	.		
26	BENZO(ghi)PERYLENE	55	0			
27	BENZO(k)FLUORANTHENE	55	0			
28	BIS(2-CHLOROETHOXY)METHANE	55	0			
29	BIS(2-CHLOROETHYL)ETHER	55	0			
30	BIS(2-CHLOROISOPROPYL)ETHER	55	0			
31	BIS(2-ETHYLHEXYL)PHTHALATE	55	10	1400	UG/G	298 1
32	BUTYL BENZYL PHTHALATE	55	0			
33	CHRYSENE	55	0			
34	DI-n-BUTYL PHTHALATE	55	0			
35	DI-n-OCTYL PHTHALATE	55	0			
36	DIBENZO(a,h)ANTHRACENE	55	0			
37	DIBENZOFURAN	55	0			
38	DIETHYL PHTHALATE	55	0			
39	DIMETHYL PHTHALATE	55	0			
40	FLUORANTHENE	55	0			
41	FLUORENE	55	0	.		
42	HEXACHLOROBENZENE	55	0			
43	HEXACHLOROBUTADIENE	55	0			
44	HEXACHLOROCYCLOPENTADIENE	55	0			
45	HEXACHLOROETHANE	55	0			
46	INDENO(1,2,3-cd)PYRENE	55	0			
47	ISOPHORONE	55	0			
48	N-NITROSO-DI-n-PROPYLAMINE	51	0			
49	N-NITROSODIMETHYLAMINE	53	0			
50	N-NITROSODIPHENYLAMINE	55	1	46	UG/G	46 0
51	NAPHTHALENE	55	0			
52	NITROBENZENE	55	0			
53	PHENANTHRENE	55	0			
54	PYRENE	51	1	40	UG/G	40 0
		********	********			
		2860	12			

TABLE 25

OU1 SEDIMENT BASE NEUTRAL EXTRACTABLE SUMMARY

S	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	1,2,4-TRICHLOROBENZENE	17	0			.
2	1,2-DICHLOROBENZENE	17	0			
3	1,3-DICHLOROBENZENE	17	0	.		
4	1,4-DICHLOROBENZENE	17	0			
5	2,4-DINITROTOLUENE	17	0	.		.
6	2,6-DINITROTOLUENE	17	0			.
7	2-CHLOROETHYL VINYL ETHER	2	0			
8	2-CHLORONAPHTHALENE	17	0			.
9	2-METHYLNAPHTHALENE	17	0			.
10	2-NITROANILINE	17	0	.		.
11	3,3'-DICHLOROBENZIDINE	17	0			.
2	3-NITROANILINE	17	0			
3	4-BROMOPHENYL PHENYL ETHER	17	0			
14	4-CHLOROANILINE	17	0			.
15	4-CHLOROPHENYL PHENYL ETHER	17	0	.		.
16	4-NITROANILINE	17	0			.
17	ACENAPHTHENE	17	0			
18	ACENAPHTHYLENE	17	0			
9	ANTHRACENE	17	0			.
20	BENZO(a)ANTHRACENE	17	0	.		.
21	BENZO(a)PYRENE	16	0			.
22	BENZO(b)FLUORANTHENE	16	0			.
23	BENZO(ghi)PERYLENE	16	0	.		.
24	BENZO(k)FLUORANTHENE	16	0			.
25	BIS(2-CHLOROETHOXY)METHANE	17	0			.
26	BIS(2-CHLOROETHYL)ETHER	17	0	.		.
27	BIS(2-CHLOROISOPROPYL)ETHER	17	0	.		.
28	BIS(2-ETHYLHEXYL)PHTHALATE	16	7	1300	UG/KG	651.429
29	BUTYL BENZYL PHTHALATE	17	0	.		.
30	CHRYSENE	17	0			.
31	DI-n-BUTYL PHTHALATE	17	8	400	UG/KG	185.625
32	DI-n-OCTYL PHTHALATE	16	0	.		.
3	DIBENZO(a,h)ANTHRACENE	16	0			
34	DIBENZOFURAN	17	0			.
35	DIETHYL PHTHALATE	17	0			
36	DIMETHYL PHTHALATE	17	0			
37	FLUORANTHENE	17	1	41	UG/KG	41.000
38	FLUORENE	17	0	.		.
39	HEXACHLOROBENZENE	17	0			.
40	HEXACHLOROBUTADIENE	17	0			
41	HEXACHLOROCYCLOPENTADIENE	17	0			
42	HEXACHLOROETHANE	17	0			
43	INDENO(1,2,3-cd)PYRENE	16	0			.
44	ISOPHORONE	17	0			
45	N-NITROSO-DI-n-PROPYLAMINE	17	0			
46	N-NITROSODIPHENYLAMINE	17	2	260	UG/KG	220.000
47	NAPHTHALENE	17	0			
48	NITROBENZENE	17	0			.
9	PHENANTHRENE	17	0			
0	PYRENE	17	1	41	UG/KG	41 000
		827	19			

TABLE 26
OU1 SOIL POLYNUCLEAR AROMATIC COMPOUND OCCURENCES

LOCATION	SAMPLE NUMBER	ANALYTE	CONCENTRATION	UNIT	QUALIFIER	DETECTION LIMIT	VALIDATION CODE	COLLECTION DATE
BH0987	BH09870010	ACENAPHTHENE	57	UG/KG		J	N	
BH1587	BH15870005	ACENAPHTHENE	57	UG/KG		J	N	
BH0987	BH09870010	ANTHRACENE	74	UG/KG		J	N	
BH1587	BH15870005	ANTHRACENE	81	UG/KG		J	N	
BH1787	BH17870005	ANTHRACENE	46	UG/KG		J	N	
BH6387	BH638718UC	ANTHRACENE	37 00	UG/KG		JB	N	18-OCT-87
BH0987	BH09870010	BENZO(a)ANTHRACENE	84	UG/KG		J	N	
BH1287	BH128702CT	BENZO(a)ANTHRACENE	36 00	UG/KG		J	N	
BH1587	BH15870005	BENZO(a)ANTHRACENE	110	UG/KG		J	N	
BH1787	BH17870005	BENZO(a)ANTHRACENE	66	UG/KG		J	N	
BH0987	BH09870010	BENZO(b)FLUORANTHENE	61	UG/KG		J	N	
BH1287	BH128702CT	BENZO(b)FLUORANTHENE	34 00	UG/KG		J	N	
BH1587	BH15870005	BENZO(b)FLUORANTHENE	86	UG/KG		J	N	
BH1787	BH17870005	BENZO(b)FLUORANTHENE	89	UG/KG		J	N	
BH0487	BH04870010	FLUORANTHENE	290	UG/KG		J	N	05-JUN-87
BH0987	BH09870010	FLUORANTHENE	240	UG/KG		J	N	
BH1287	BH128702CT	FLUORANTHENE	110 00	UG/KG		J	N	
BH1587	BH15870005	FLUORANTHENE	350	UG/KG			N	
BH1787	BH17870005	FLUORANTHENE	200	UG/KG		J	N	
BH0987	BH09870010	FLUORENE	54	UG/KG		J	N	
BH1587	BH15870005	FLUORENE	55	UG/KG		J	N	
BH0987	BH09870010	INDENO(1,2,3-cd)PYRENE	47	UG/KG		J	N	
BH0487	BH04870010	PHENANTHRENE	210	UG/KG		J	N	05-JUN-87
BH0987	BH098706WT	PHENANTHRENE	35	UG/KG		J	N	
BH0987	BH09870010	PHENANTHRENE	310	UG/KG		J	N	
BH1287	BH128702CT	PHENANTHRENE	92 00	UG/KG		J	N	
BH1587	BH15870005	PHENANTHRENE	370	UG/KG			N	
BH1787	BH17870005	PHENANTHRENE	180	UG/KG		J	N	
BH0487	BH04870010	PYRENE	240	UG/KG		J	N	05-JUN-87
BH0987	BH09870010	PYRENE	250	UG/KG		J	N	
BH1287	BH128702CT	PYRENE	110 00	UG/KG		J	N	
BH1587	BH15870005	PYRENE	270	UG/KG		J	N	
BH1787	BH17870005	PYRENE	140	UG/KG		J	N	

TABLE 27

OU1 SOIL PESTICIDE/PCB SUMMARY

	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	4,4'-DDD	85	0			.
2	4,4'-DDE	85	0			
3	4,4'-DDT	85	0			
4	ALDRIN	85	0	.		.
5	AROCLOR-1016	85	0	.		
6	AROCLOR-1221	85	0			
7	AROCLOR-1232	85	0			
8	AROCLOR-1242	85	0			
9	AROCLOR-1248	85	0			.
10	AROCLOR-1254	85	3	70	UG/KG	52.3333
11	AROCLOR-1260	85	0			.
12	CHLORDANE	85	0			.
13	DIELDRIN	85	0	.		.
14	ENDOSULFAN I	85	0	.		
15	ENDOSULFAN II	85	0	.		
16	ENDOSULFAN SULFATE	85	0			.
17	ENDRIN	85	0			
18	ENDRIN KETONE	85	0			.
19	HEPTACHLOR	85	0			.
20	HEPTACHLOR EPOXIDE	85	0	.		
21	METHOXYCHLOR	85	0			
22	TOXAPHENE	85	0	.		
23	alpha-BHC	85	0	.		
24	beta-BHC	85	0	.		.
25	delta-BHC	85	0	.		
26	gamma-BHC (LINDANE)	85	0	.		
		2210	3			

TABLE 28

OU1 FRENCH DRAIN INVESTIGATION PESTICIDE/PCB SUMMARY

S	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	4,4'-DDD	56	0			.
2	4,4'-DDE	56	0			.
3	4,4'-DDT	51	0			.
4	ALDRIN	51	0			.
5	AROCLOR-1016	56	0	.		.
5	AROCLOR-1221	56	0	.		.
7	AROCLOR-1232	56	0			
8	AROCLOR-1242	56	0			
9	AROCLOR-1248	56	0			.
0	AROCLOR-1254	56	0			.
11	AROCLOR-1260	56	0	.		.
2	DIELDRIN	51	0			
3	ENDOSULFAN I	56	0	.		.
14	ENDOSULFAN II	56	0	.		.
15	ENDOSULFAN SULFATE	56	0			.
6	ENDRIN	51	0	.		
17	ENDRIN KETONE	56	0			.
18	HEPTACHLOR	51	0			.
9	HEPTACHLOR EPOXIDE	56	0			
0	METHOXYCHLOR	56	0	.		.
21	TOXAPHENE	56	0			.
2	alpha-BHC	56	0	.		.
3	alpha-CHLORDANE	56	0	.		.
24	beta-BHC	56	0	.		.
25	delta-BHC	56	0	.		.
6	gamma-BHC (LINDANE)	51	0			.
27	gamma-CHLORDANE	56	0	.		.
		1482	0			

TABLE 29

OU1 SEDIMENT PESTICIDE/PCB SUMMARY

	ANALYTE	RAWCOUNT	HITCOUNT	MAXVAL	MAXUNIT	AVEVAL
1	4,4'-DDD	20	0			
2	4,4'-DDE	20	0	.		.
3	4,4'-DDT	20	0	.		
4	ALDRIN	20	0	.		
5	AROCLOR-1016	20	0			.
6	AROCLOR-1221	20	0			
7	AROCLOR-1232	20	0	.		
8	AROCLOR-1242	20	0	.		.
9	AROCLOR-1248	20	0			.
10	AROCLOR-1254	20	0	.		.
11	AROCLOR-1260	20	0	.		.
12	CHLORDANE	2	0			
13	DIELDRIN	20	0			
14	ENDOSULFAN I	20	0	.		
15	ENDOSULFAN II	20	0			.
16	ENDOSULFAN SULFATE	20	0	.		
17	ENDRIN	20	0	.		.
18	ENDRIN KETONE	20	0	.		
19	HEPTACHLOR	20	0	.		.
20	HEPTACHLOR EPOXIDE	20	0	.		.
21	HEXAVALENT CHROMIUM	2	0	.		
22	METHOXYCHLOR	20	0	.		
23	TOXAPHENE	20	0	.		
24	alpha-BHC	20	0	.		.
25	alpha-CHLORDANE	18	0	.		
26	beta-BHC	20	0	.		.
27	delta-BHC	20	0	.		.
28	gamma-BHC (LINDANE)	20	0	.		.
29	gamma-CHLORDANE	18	0	.		.
		540	0			

TABLE 30
OU1 SOIL PESTICIDE/PCB OCCURRENCES

LOCATION	SAMPLE NUMBER	ANALYTE	CONCENTRATION	UNIT	QUALIFIER	DETECTION LIMIT	VALIDATION CODE	COLLECTION DATE
BH0987	BH098706WT	AROCLOR-1254	44	UG/KG			N	
BH1187	BH11870010	AROCLOR-1254	43	UG/KG			N	
BH1287	BH128702CT	AROCLOR-1254	70	UG/KG			N	

TABLE 31

SITE-SPECIFIC CHEMICAL ANALYSIS ROSTER

MATRIX	ANALYTICAL SUITES			
	Volatile Organics	Acid Extractables	Base/Neutral Extractables	Pesticides/ PCBs
Waste Sources	Yes [4]	Yes [2]	Yes [2]	Yes [2]
Soils/Sediments	Yes [4]	No [2]	No [2]	No [2]
Ground Water	Yes [4]	No [2]	No [2]	No [2]
Surface Water	Yes [4]	No [2]	No [2]	No [2]

Notes:

Case Determination

[1] Case I

[2] Case II, however, further data required only for IHSSs that were not previously investigated (see Table 22)

[3] Case II, Supplemental Data Required

[4] Case III, Data Required

REFERENCES

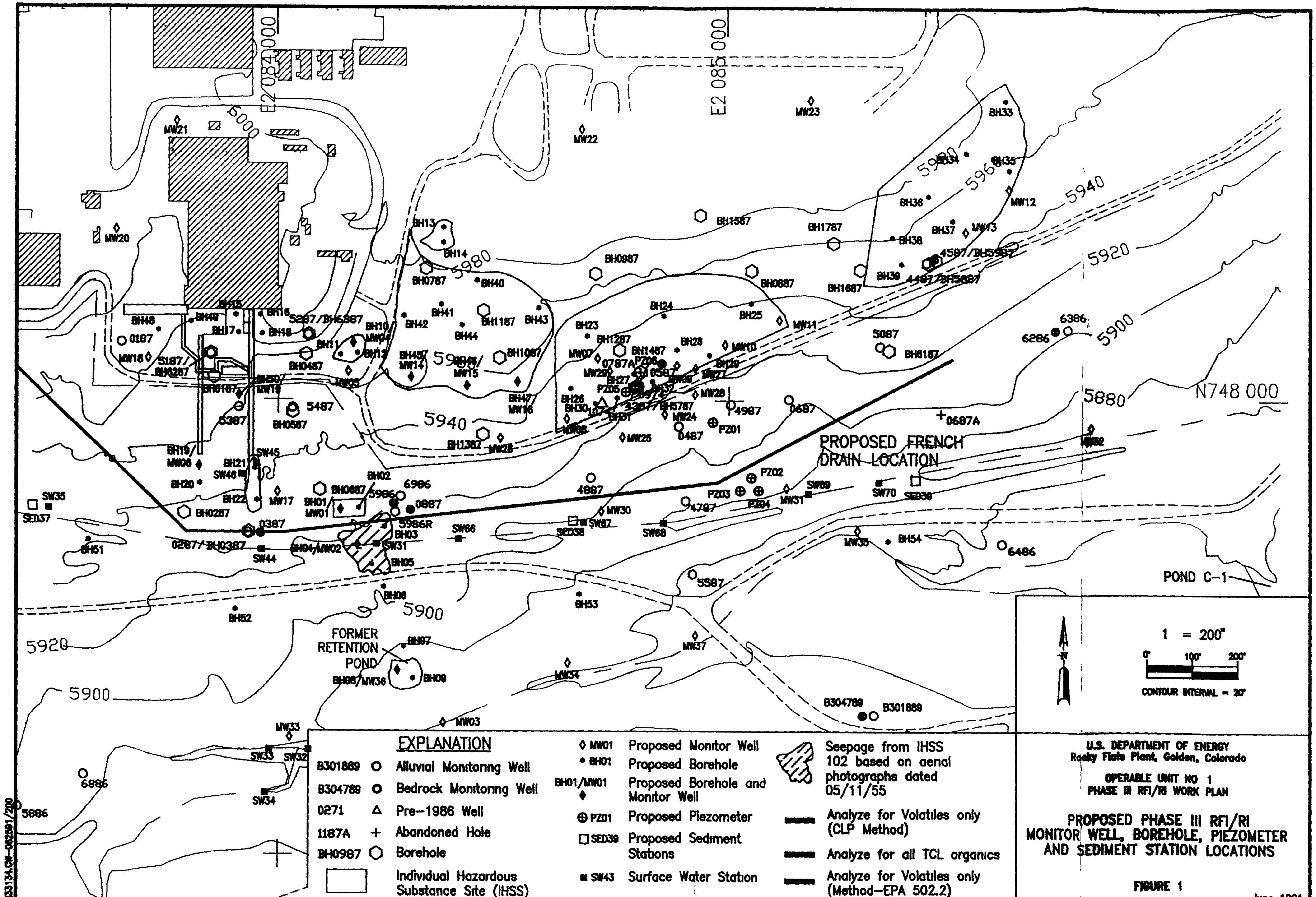
EPA, 1988, Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA OSWER Directive 9355 3-01

EPA, 1989, Data Quality Objectives for Remedial Response Activities OSWER Directive 9355 0-7B

TABLE 22

Source Characterization Boreholes For IHSSs Not Previously Drilled

IHSS	Boreholes
Oil Sludge Pit Site (IHSS Ref. No 102)	BH01 through BH09
Chemical Burial Site (IHSS Ref No 103)	BH10 through BH12
Liquid Dumping Site (IHSS Ref No 104)	BH13, BH14
Out Fall Site (IHSS Ref No 106)	BH19, BH20
Sanitary Waste Line Leak Site (IHSS Ref No 145)	BH48, BH49


PROPOSED FRENCH DRAIN LOCATION
FORMER RETENTION POND
POND C-1
N748 000
E2 084 000
E2 085 000
1 = 200'
0' 100' 200'
CONTOUR INTERVAL = 20'
EXPLANATION
B301889 Alluvial Monitoring Well
B304789 Bedrock Monitoring Well
0271 Pre-1986 Well
1187A Abandoned Hole
BH0987 Borehole
Individual Hazardous Substance Site (IHSS)
MW01 Proposed Monitor Well
BH01 Proposed Borehole
BH01/MW01 Proposed Borehole and Monitor Well
PZ01 Proposed Piezometer
SED39 Proposed Sediment Stations
SW43 Surface Water Station
Seepage from IHSS 102 based on aerial photographs dated 05/11/55
Analyze for Volatiles only (CLP Method)
Analyze for all TCL organics
Analyze for Volatiles only (Method-EPA 502.2)
U.S. DEPARTMENT OF ENERGY
Rocky Flats Plant, Golden, Colorado
OPERABLE UNIT NO 1
PHASE III RFI/RI WORK PLAN
PROPOSED PHASE III RFI/RI MONITOR WELL, BOREHOLE, PIEZOMETER AND SEDIMENT STATION LOCATIONS
FIGURE 1
June 1991
R33134.CW-062591/200